



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/604,662	06/27/2000	Lawrence Kwong Lam	18180.0023	3684

7590 03/11/2003

Edward J Naidich  
Swidler Berlin Shereef Friedman LLP  
3000 K Street NW Suite 300  
Washington, DC 20007-5166

EXAMINER

TURNER, SAMUEL A

ART UNIT	PAPER NUMBER
----------	--------------

2877

DATE MAILED: 03/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS  
UNITED STATES PATENT AND TRADEMARK OFFICE  
WASHINGTON, D.C. 20231  
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 12

Application Number: 09/604,662  
Filing Date: June 27, 2000  
Appellant(s): LAM ET AL.

John P. Moran  
For Appellant

**EXAMINER'S ANSWER**

**MAILED**  
MAR 10 2003  
**GROUP 2800**

This is in response to the appeal brief filed 6 February 2003.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(6) *Issues***

The appellant's statement of the issues in the brief is correct.

**(7) *Grouping of Claims***

The appellant's statement in the brief that certain claims stand or fall together is not agreed with because claim 20 is of differing scope than claims 1 and 13. Therefor claims 1-19, and 21-23 stand or fall together and claims 20 and 24 stand or fall together.

**(8) *Claims Appealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

4,747,688	Geary	5-1988
5,172,185	Leuchs et al	12-1992

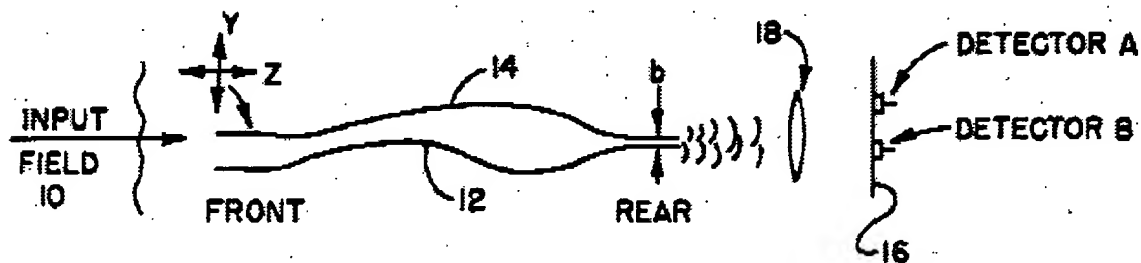
Applicant's prior art figure 1.

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

**Rejections Under 35 U.S.C. § 102**

Claims 20 and 24 are rejected under 35 U.S.C. § 102(b) as being clearly anticipated by Geary(4,747,688). This rejection is set forth in prior Office action, Paper No. 6.



**FIG. 1**

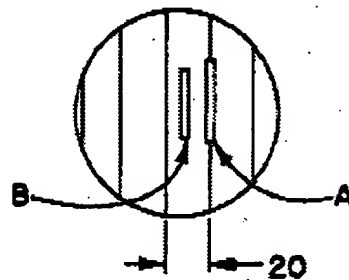


FIG. 2

Table 1 is a limitation by limitation comparison between claim 20 and Geary.

table 1

Claim 20 method limitations:	Geary(see figures 1 and 2 above
producing an interference pattern based on an input signal	an interference pattern is generated from an input field the two waveguides(12,14)
detecting the location of a null of the interference pattern	detector A detects the dark fringe(null), see column 4, lines 60+
producing an output signal based on the location of the null	a signal is generated based on the location of the null

### Rejections Under 35 U.S.C. § 103

Claims 1-6, 13, 14, 16, 17, and 21-23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the prior art of figure 1 in view of Leuchs(5,172,185). This rejection is set forth in prior Office action, Paper No. 6.

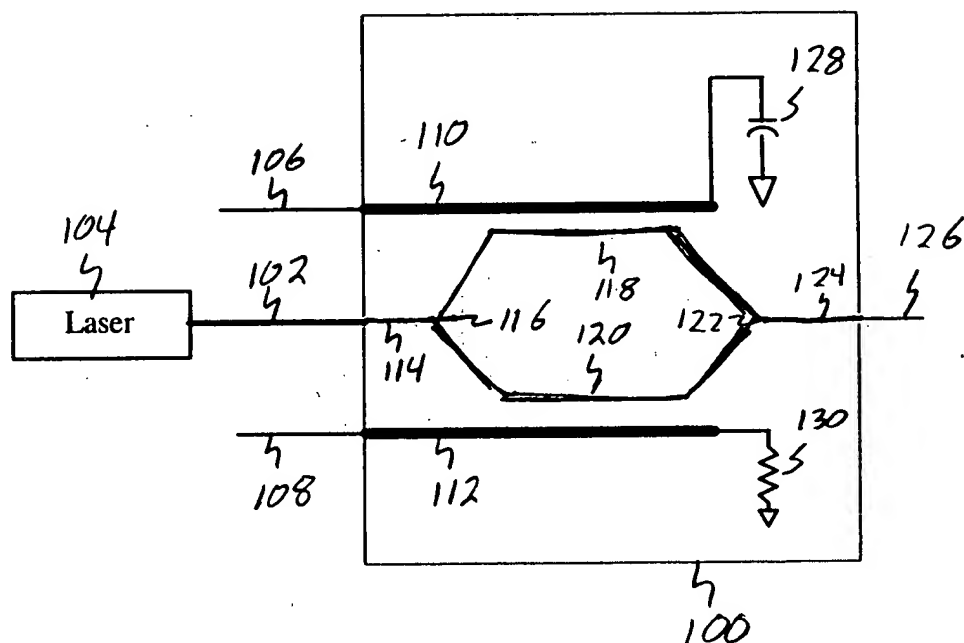
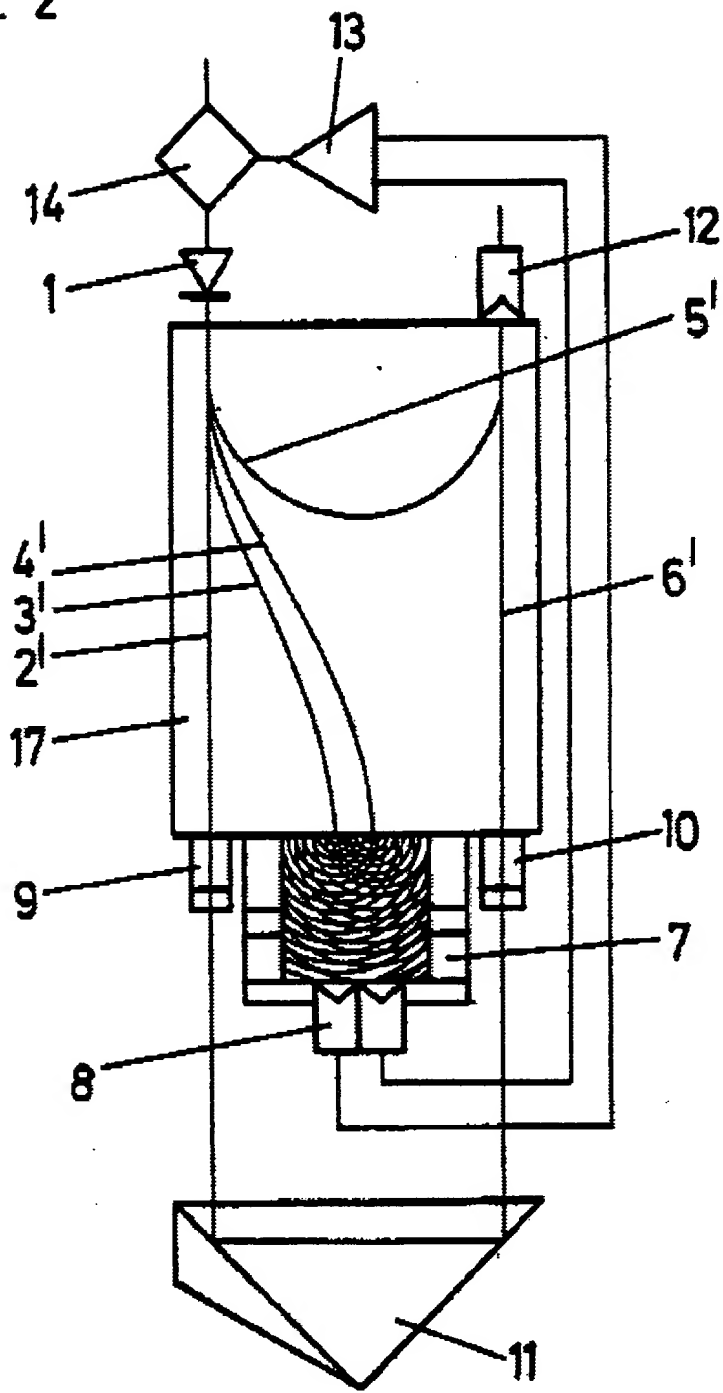


FIG. 1

The prior art of figure 1 teaches an voltage sensor comprising a laser source(104), an integrated optics chip(100), and detector. The IOC includes a Mach-Zehnder interferometer and electrodes(110,112) matched to each arm of the interferometer. Not taught are the interferometer arm terminating at the edge of the IOC so as to produce an interference pattern on the detector, or a lens assembly positioned between the waveguide outputs and the detector.

Fig. 2



Art Unit: 2877

Leuchs et al(5,172,185) teach an IOC sensor wherein the waveguides(3,4) terminate at the edge of the IOC so as to produce an interference pattern on the detectors(8). See figure 2. Note that the waveguides can intersect the edge of the IOC at other than 90°, column 3, lines 23-27. The Leuchs waveguide output arrangement requires no output couplers, thus providing a reduction in parts.

Tables 2 and 3 show a limitation by limitation comparison between claims 1 and 13 respectively and applicant's figure 1 prior art and Leuchs et al.

table 2

Claim 1 apparatus limitations	Applicant's figure 1 prior art	Leuchs et al teaching
a first waveguide producing a first optical output	a first waveguide(118) which produces a first optical output to coupler(122)	a first waveguide(3') terminates at the edge of substrate(17)
first electrode parallel to the first waveguide	first electrode(110)	
a second waveguide producing a second optical output	a second waveguide(120) which produces a second optical output to coupler(122)	a first waveguide(4') terminates at the edge of substrate(17)
second electrode parallel to the second waveguide	second electrode(112)	
a photodetector in the path of the interference pattern produced by the first and second optical outputs	a photodetector which detects the interfered output signal from waveguide(126)	photodetectors(8) an interference pattern produced by the output of the waveguides



Art Unit: 2877

table 3

Claim 13 method limitations	Applicant's figure 1 prior art	Leuchs et al teaching
electro-optically modulating a first optical signal with a first electrical signal	the optical signal in the first waveguide(118) is electro-optically modulated by electrode(110)	unmodulated first optical signal
electro-optically modulating a second optical signal with a second electrical signal	the optical signal in the second waveguide(118) is electro-optically modulated by electrode(110)	unmodulated second optical signal
producing an interference pattern from the two optical signals	optical signal are interfered at the coupler and do not form an interference pattern	optical signal form an interference pattern on detectors(8)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the coupler output of the Figure 1 prior art with the simplified waveguide output, as taught by Leuchs, to reduce the number of parts on the IOC.

Claims 7-12, 15, 18, and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Leuchs et al(5,172,185) as applied to claims 1-6, 13, 14, 16, 17, and 21-23 above, and further in view of Geary(4,747,688). This rejection is set forth in prior Office action, Paper No. 6.

Geary(4,747,688) teach the use of magnifying optics(18) that can be positioned between the waveguide ends and the detector array(A,B). See figure 1. Note that one detector is positioned to detect the dark fringe.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a lens assembly between the waveguide ends and the detector array in order to magnify the size of the fringes. Other waveguide output

coupling optics, such as prisms, lens, or a Rotman lens, can be used to couple the output fringe pattern to the detector array.

**(11) Response to argument**

**Rejections Under 35 U.S.C. § 102**

Applicant argues that the signal of Geary is based on two detectors A and B. However nothing in method claim 20 restricts the claim to a single detector of detecting the dark and bright fringe. The signal generated by from detector A is the position of the dark fringe.

**Rejections Under 35 U.S.C. § 103**

In response to applicant's arguments against the references individually, one cannot show non-obviousness by attacking references individually where the rejections are based on combinations of references. *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Applicant argues what Leuchs does not teach and not the combination of applicant's figure 1 prior art in view of Leuchs. Leuchs does suggest that the output of two waveguides can be coupled together and the interference intensity measured with a single detector 12 (figure 2) or the light from each waveguide can be coupled out of the waveguide and interfered and the resultant interference pattern detected by a detector array 12 (figure 1). By applying this suggestion to applicant's prior art figure 1 the claimed limitations are met.

With regard to the 35 U.S.C. § 103(a) of claims 7-12, 15, 18, and 19 the addition of the magnifying optics(18) as suggested by Geary would have simply imaged the interference fringe pattern onto the detector array and magnified the fringes for easier detection. Clearly it is not the prior art figure 1 where the suggestion to combine is found but in Leuchs and Geary.

Art Unit: 2877

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



Samuel A. Turner  
Primary Examiner  
Art Unit 2877

SAT

March 5, 2003

Conferees

Samuel A. Turner

Frank Font *FF*

Olik Chaudhuri *OC*

Edward J Naidich

Swidler Berlin Shereef Friedman LLP

3000 K Street NW Suite 300

Washington, DC 20007-5166